

## **Abstract**

A method of reducing vulcanized rubber is provided. The method comprises the steps of heating the rubber, wherein the rubber includes synthetic rubber, in the presence of a solvent, wherein the solvent includes water to a temperature below a critical temperature of the solvent, providing a pressure that is at least equal to a saturated vapour pressure of the solvent at the temperature and maintaining the temperature and the pressure for a time sufficient to devulcanize the rubber and produce a reaction product that is primarily a solid phase and includes rubber hydrocarbon.